

NAVY DEPARTMENT



# BUINED NEWS LETTER

a digest of timely information

EDITOR - CAPTAIN W. W. HALL, (MC), U.S.NAVY

Vol. 2

Friday, July 23, 1943

No. 2

An Order by Field Marshal Sir Archibald Wavell: "That the highest authorities fully appreciate the importance of the medical aspects of modern warfare is shown in the following recent India Army Order by Field Marshal Sir Archibald Wavell.

'In theatres where future operations are likely to take place we may well find that disease, and especially malaria, is a more dangerous factor than enemy resistance. We have already had experience of the effects of a bad malarial season in Assam.

'We must prepare to meet malaria by training as strict and earnest as against enemy troops; we must be as practised in the use of our weapons against it--the mosquito net, long sleeves and trousers, Flit gun--as we are with the rifle; we must study the habits of the mosquito as we do the tactics of the Japanese; we must know methods of anti-mosquito work--canalization, oiling, etc., as well as how to construct trenches to hold a position.'

"At the same time it must be emphasized that the most potent weapon against malaria is suppressive mepacrine (atabrine). Provided mepacrine is conscientiously and regularly taken by all troops as prescribed in the War Office pamphlet 'Malaria, 1943,' page 9, the disease is most unlikely to develop.

"It is the duty of those in authority to ensure that the tablets of mepacrine are taken on the correct days each week. This measure should take first place in the fight to prevent decimation of our troops by malaria in hyperendemic areas." (Army Med. Dept. Bull., Apr. '43 - issued by War Office, London.)

\* \* \* \* \*

Military Malaria Control: "In this paper military malaria control is discussed and it is noted that in hyperendemic areas malaria is the principal disease hazard to troops. It is pointed out that military malaria control involves (a) fixed installations, around which mosquito control measures are feasible, and in which individual control measures are subsidiary, and (b) field areas, in which troops are fighting or maneuvering, are on guard or

sentry detail or are servicing convoys or airplanes, usually without the protection of mosquito control. Here 'fighting malaria control' is required and measures of individual malaria prophylaxis are vital, with full use of suppressive antimalaria drugs, bed nets, protective clothing, sprays and repellents, and with intelligent cooperation by all ranks. Finally, the importance of malaria discipline is stressed.

"Malaria discipline is defined as a state of orderly and effective conduct or action on the part of soldiers in respect to malaria control. It implies ability and readiness to practice malaria control as outlined, particularly the individual measures. When there is malaria discipline in a company, screens and bed nets are in good repair and are properly used, protective clothing and repellents are employed to the fullest practical extent, suppressive treatment is faithfully taken as ordered and men do not expose themselves heedlessly to mosquito bites. Good malaria discipline reduces to a minimum such dangerous practices as loitering, fishing or swimming after dusk in malarious places.

"Malaria discipline is developed by careful indoctrination of officers and enlisted men, and it presupposes constant supervision by those in command.

"Malaria control is never automatic. In highly infested areas it requires of the Medical and Sanitary Corps officers concerned unremitting attention to small details. Success is possible only when there is a high degree of co-operation among all ranks and all branches in outwitting the *Anopheles* mosquito." (Russell, War Med., June '43.)

\* \* \* \* \*

Breeding Places for Mosquitoes Aboard Ship: A note has been received from the medical officer of a vessel operating in the South Pacific suggesting that in the transfer of certain items of ordnance, for instance a machine gun, the water contained in the jacket may bear larvae of mosquitoes. This is theoretically possible, and if possible perhaps important, as many of the islands on which action is now in progress are heavily malarious. Men and equipment are often loaded and transferred aboard ship to malaria-free islands. Collections of water in odd places aboard ship such as rain water in folds of canvas, life boats or other receptacles may also bear mosquito larvae. The drainage of these casual accumulations of water or covering with kerosene would eliminate these larvae.

A ship which arrived in a malaria-free port bearing malaria patients, and at the same time, the mosquito vector of malaria would surely not be a welcome visitor.

\* \* \* \* \*

Pilonidal Cyst: Average healing time in 30 cases is 13.3 days, by using anatomical dissection of the cyst and sinus tracts. Block excision is deprecated. (Brezin, et al., Amer. J. Surg., May '43.)

\* \* \* \* \*

Errors in Iso-Agglutination Tests: Discovery and study of men from Navy, Army and civilian activities whose identification records bore erroneous blood groups suggested the following recommendations: (1) All technicians doing blood grouping must be thoroughly instructed in the theory as well as the practice of the method; (2) only high titer serum should be used in making iso-agglutination tests, preferably 1:40 at least; (3) a technic should be employed which permits observing the reaction for at least an hour; (4) health record or identification tag of an individual in the service may not be assumed to carry always the correct blood group. (Shackford, Nav. Med. Bull., July '43.)

\* \* \* \* \*

The recommendations in regard to the technic of blood typing made by Shackford are similar to those which were made by the Conference on Blood Grouping, National Research Council, with the exception that the National Research Council Conference recommended a titer of over 1:100 and a time limit of 30 minutes. Methods and technic of titration vary widely and figures used in this connection are often without the significance of exactness which their use may imply. The chief difficulty of the use of one hour instead of 30 minutes observation periods is the drying of the preparation which, as Shackford points out, can be avoided by sealing the preparation from the air. False agglutination may occur with the use of inferior typing sera or in cross matching, but an experienced technician should be able to distinguish them.

It is well known that many errors occur whenever mass typing is carried out. The identification tags are an aid in selecting donors for blood groups. However, individuals should never be used as blood donors without confirming the blood group or cross matching. (L.R.N.)

\* \* \* \* \*

Malignant Leukopenia Successfully Treated with Sulfapyridine: The author describes two cases of highly toxemic infections of the urinary tract, characterized by considerable leukopenia and granulocytopenia. Other therapeutic measures proving of no avail, it was decided to administer sulfapyridine in small doses, contrary to the generally accepted clinical rule that sulfonamides are strictly contraindicated in all cases of leukopenia. Both cases showed rapid improvement of the general condition, especially of the white blood picture, leading to recovery from seemingly hopeless conditions. (Heilig & Visveswar, J.A.M.A., June 26, '43.)

\* \* \* \* \*

Explosive Injury Due to Solid Carbon Dioxide: The expansive force of solid carbon dioxide is tremendous, and with its increasing commercial importance explosive injuries of the type described by the author will become more frequent. The author reports the case of a 14-year old boy who placed a block of "dry ice" in a can partially filled with water. The can exploded severely damaging the boy's face. (Goehring, J.A.M.A., June 26, '43.)

\* \* \* \* \*

The Copper Sulfate Method for Measuring Specific Gravities of Whole Blood and Plasma: We have been advised that errors have occurred in following the directions for preparing the copper sulfate solutions, both the saturated solution, and the stock solution of gravity 1.100. Unless the instructions at three points in the procedure are followed exactly as given, solutions of incorrect gravity will result. It is hoped that a re-emphasis of the instructions on these three points will eliminate such difficulties in the future.

1. The  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  crystals must be pulverized, or fine enough to pass through a No. 20 wire mesh, if saturation is to be effected in five minutes of vigorous shaking.
2. In preparing the saturated solution by shaking copper sulfate crystals with water for five minutes a sufficient excess of the crystals must be present. Four pounds of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  to 2.5 liters of water provides this excess; less than this amount of copper sulfate may not suffice.
3. The temperature of the saturated solution must be taken at the moment the saturation is completed, i.e., immediately at the end of the five-minute shaking period.

When copper sulfate crystals dissolve in water heat is absorbed by the process of solution. Thus, if water at room temperature is saturated with copper sulfate by shaking the water with pulverized  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  crystals for five minutes this solution will now be about 3°C. below room temperature. However, it is at this lower temperature that the solution is saturated. Table 1 (Bumed News Letter, June 25, 1943, page 12) is based on the temperature of the supernatant solution immediately at the end of the five-minute shaking and not on its temperature even a minute or two later, i.e., not after it is decanted off the crystals, nor subsequently after filtration. By the time the solution has been decanted from the undissolved crystals and filtered, it will usually be back to room temperature and will not now be saturated, since a solution saturated at a higher temperature contains more copper sulfate than a solution saturated at a lower temperature. For example, of a solution saturated at 20°, 488 cc. (Table 1, above) is diluted to 1 liter to make a solution of gravity 1.100. If the temperature of saturation were taken as 23°, only 466 cc., according to the table, would be taken for dilution to a liter, and the resulting stock solution would have a gravity of 1.092 instead of 1.100.

The following points may also be useful:

1. Instead of preparing the stock solution of gravity 1.100 from a saturated solution it may be prepared by dissolving 159.63 grams of  $\text{CuSO}_4 \cdot 5\text{H}_2\text{O}$  in water and making the solution up to a volume of 1000 cc.
2. The accuracy of the stock solution of gravity 1.100 can be checked by weighing 100 cc. in a volumetric flask, and then weighing 100 cc. of distilled water at the same temperature in the same flask. The copper sulfate solution should weigh 10 grams ± 10 mg. more than the water.
3. Rain water, or tap water of gravity not more than 1.0003 compared to distilled water at the same temperature as 1.0000, may be used in place of distilled water for preparing the saturated, stock and standard solutions. (R.A.P.)

Importance of Adequate Amounts of Blood, Serum or Plasma: The importance of early transfusion in adequate amounts is stressed. Not less than 600 cc. should be given initially. If this amount does not produce a sustained improvement, more must be given. No difference between plasma and serum has been detected from the clinical viewpoint. (Lang & Schwiegk, Deut. Militärarzt, June '42.)

\* \* \* \* \*

Small amounts (250 to 500 cc.) of plasma are entirely inadequate in restoring the depleted plasma volume. It is often necessary to give to the severely injured 1 to 2 liters of plasma. Serum and plasma produce results which are quite comparable. (Nav. Med. Bull., Oct. '41.)

\* \* \* \* \*

In the Russian army blood transfusion has been extensively used. While the usual amount recommended for a single transfusion is from 500 to 1,000 cc. of blood, the authors have found this amount insufficient in many cases and have been obliged to increase it to 2,000 to 5,000 cc. (Kaplan & Khanin, Klin. Med. (Nos. 1-2) 20:31, '42.)

\* \* \* \* \*

The three abstracts printed above aptly illustrate the present universality of thought concerning the wisdom of administering an adequate amount of blood or blood derivative early following trauma or of blood derivative following burns. The clinical equality of properly prepared serum and plasma is not generally appreciated. The words "properly prepared serum" mean that serum requires "aging" in the liquid state for at least one month to decrease the percentage of untoward reactions which occur when fresh serum is administered. One theory as to the cause of reactions which occur following the use of fresh serum is that when blood clots, an excess of thrombin, which is very toxic when injected intravenously, is liberated in the serum. The Canadians are using dried "aged" serum and the British are using both liquid and dried "aged" serum in addition to plasma. (L.R.N. & E.L.L.)

\* \* \* \* \*

Motor Complications of Herpes Zoster: Taterka and O'Sullivan call attention to the fact that in Herpes Zoster, pathological changes show a multitude of lesions, with the dorsal ganglion the most frequently diseased part. They report two cases of motor paralysis, complicating Herpes Zoster in which the muscles mainly affected were the quadriceps and deltoid.

In an analysis of 44 cases they show that the pareses did not necessarily coincide with the herpetic eruption in localization and extension. The time interval between the cutaneous eruption and the appearance of paralysis (or vice versa) may range, they say, from one day to two months. (J.A.M.A., July 10, '43.)

\* \* \* \* \*

Mobile Hospitals - General Information Regarding: No hard and fast rules can be laid down for the establishment of Mobile Hospitals. Each one presents its own problem of arrangement, erection and operation, which is dependent on climate, terrain, source of supplies and many other variables that cannot be anticipated. Certain basic factors are common to all of the Mobile Hospitals and many of the general problems can be worked out in advance. A speedy erection can be accomplished by careful planning and organization.

The Surgeon General's original concept of these hospitals was to provide a reasonable number of hospital beds and the usual hospital facilities in a form that could readily be moved into bases where hospital facilities might be required. To further this aid, the hospitals are organized as units of the forces afloat and are thus available for assignment by the Fleet command to any area. The hospitals are expected to be, in general, self-supporting, and having been delivered at the selected site, the entire outfit can be put into operation by its own personnel and is dependent on others only for fuel, food and water. At the present time, it is hoped that the hospitals will be erected by Construction Battalions (Sea Bees), if they are available in the area of the ultimate destination. Should this be the case, a liaison will have to be established between the Hospital Unit and the Sea Bees since much of the information and the erection instructions will be in the hands of the Commanding Officer of the Mobile Hospital concerned. The hospital will have already been commissioned and the accountability of the material and equipment will fall directly on the Commanding Officer of the Hospital. In either case the hospital personnel will be directly concerned with the supervision, unloading, transportation and storage of this material and equipment.

Mobile Hospitals Nos. 9, 10, 11 and 12 have been organized on the basis of one thousand beds and are to be shipped in two echelons. The first shipment contains most of the basic equipment, but it is by no means complete in all departments. It is intended that the second shipment should arrive about the time the buildings and equipment supplied in the first shipment are erected, so that the erection of the entire hospital can be accomplished in a continuous erection schedule. In the layout and the erection of the initial shipment, space should be allotted for increased facilities which will arrive in the second echelon. During the first period, a minimum of hospital facilities should be well established.

The total physical equipment included in a one-thousand-bed hospital will require a site of approximately 25 acres. One hundred seventy prefabricated, Task Force Type, insulated, steel buildings of a standard 20 x 50 foot size have been provided for housing the hospital and personnel. This is a total of 8,500 linear feet of building, 20 feet wide, which can be erected as any number of buildings of various lengths constructed in units of 10 feet, up to a total of 170 buildings. Instructions for erection of buildings, installation of equipment and necessary tools are supplied.

Facilities for water purification, softening, storage and distribution, toilet facilities, cooking, messing, laundry, fire fighting, light and power refrigeration facilities, garbage disposal, etc., have been provided. There

is a complete outfit of medical and surgical supplies, including X-ray, laboratory and dental facilities. This equipment is adequate for ordinary hospital needs. Many items, such as special surgical instruments or special drugs which may be desirable have not been included, but may be requisitioned after the hospital is in operation. The present outfit is considered adequate to meet all basic needs and it is not desirable to include special items before starting out.

The first shipment makes up over 1200 tons of stores, or about  $2\frac{1}{2}$  tons for each officer and man. All of this must be transported, usually by ship, unloaded, carried in trucks to the building site, and then erected. Individual pieces will vary from 10 pounds to several tons in weight, and there are about 12,000 individual pieces to be handled, exclusive of the steel buildings (about 3,000 more). (Reprinted from the Medical Supply News Letter - U.S.N. Med. Supply Depot, Brooklyn, N.Y.)

\* \* \* \* \*

On Checking Requisitions: All requisitions received by N.M.S.D., Brooklyn, are reviewed by experienced officers of the Medical, Dental, and Hospital Corps. When amounts appear excessive, information is sought to justify the demand. Frequently it becomes necessary to return the requisition to the originator. In this restudy and revision of their requisitions, many activities are rendering helpful service to the cause of conservation - a factor of utmost importance in these days of increasingly difficult procurement. (Reprinted from the Medical Supply News Letter - U.S.N. Med. Supply Depot, Brooklyn, N.Y.)

\* \* \* \* \*

Economy Conscience: In Medical Supply News Letter No. 1-43, mention was made of a simple procedure for determining a normal rate of issue (per patient, clinic or department) of any or all items in the Catalog; that by establishing such a procedure waste could be easily detected, and controlled, and data for logistic purposes would be readily available, data that would also prove helpful in comparing the efforts of personnel to conserve supplies.

Those interested in ascertaining end results of such a system may obtain illuminating information by communicating with Captain C.V. Rault, Senior Dental Officer, Navy Yard, New York, and Captain H.S. Harding, MC, U.S. Navy, Commanding Officer, U.S. Naval Hospital, Naval Training Station, Farragut, Idaho. (Reprinted from the Medical Supply News Letter - U.S.N. Med. Supply Depot, Brooklyn, N.Y.)

\* \* \* \* \*

Specific Treatment of Typhoid - The Ineffectiveness of Sulfathiazole and Immune Serum: Hoagland reports a survey of fifty-nine patients with typhoid. The administration of sulfathiazole did not affect the course of the illness, complications, mortality rate or occurrence of the carrier state. The use of serum obtained from previously inoculated persons was valueless. (J.A.M.A., July 3, '43.)

\* \* \* \* \*

Epinephrine and Related Substances in Human Arterial Walls and Kidneys; Their Role in Arteriosclerosis: Author's summary - "Epinephrine and epinephrine-like substances (adrenal catechols) were determined colorimetrically in human aortas, renal arteries and kidneys. Infantile tissues contained the lowest total amounts of chromogenic material, consisting almost entirely of epinephrine proper or sympathin. With advancing age, increasing amounts of other epinephrine-like substances, similar to those produced by the adrenal medulla, were found to accumulate in vascular walls and kidneys. Sclerotic aortas contained high concentrations of chromogenic material, other than epinephrine proper, more frequently than normal aortas. The role of adrenal hormones and sympathin as intrinsic damaging agents in the origin of arteriosclerosis is discussed."

The author substantiates the statement classifying adrenal hormones and sympathin as intrinsic damaging agents in the origin of arteriosclerosis as follows:

"That epinephrine and related substances play an outstanding role in the development of arteriosclerosis and arteriolar sclerosis is suggested by the following facts: (a) In animals repeated injections of epinephrine hydrochloride produced severe medial changes in arteries, analogous to those found in human arteriosclerosis. (b) In rabbits experimental cholesterol lipoidosis of the intima was found to be greatly enhanced by injections of epinephrine. (c) Epinephrine is absorbed by arterial tissue in vitro. (d) Repeated implantations of adrenal tissue cause vascular changes similar to arteriolar-sclerosis. (e) Arteriosclerosis and arteriolar sclerosis, including nephrosclerosis, are common in persons with tumors of the adrenal glands, even in infancy and youth. (f) Most patients with pituitary disorders which are accompanied by hyperplasia of the adrenal glands show arteriosclerotic changes." (Raab, Arch. Path., June '43.)

\* \* \* \* \*

Sympathin is a substance which is similar if not identical with epinephrine and is liberated at the terminals of all adrenergic nerves. It may be remembered that in the chemical mediation of impulses, nerves are divided into the cholinergic (parasympathetic and voluntary) and adrenergic (sympathetic).

\* \* \* \* \*

Glycosuria - 367 Cases in 45 Thousand Army Induction Examinations (0.8%): Further study of these cases by repeated urine examinations and sugar tolerance tests of those repeatedly positive, resulted in classification of the cases into three groups, i.e., (1) 208 cases of diabetes mellitus; (2) 126 cases of transient glycosuria; (3) 33 cases of renal glycosuria. "The diagnosis of renal glycosuria was made when the subject had a normal blood sugar curve and specimens of urine contained varying amounts of sugar after the ingestion of 100 gm. of dextrose." There were no symptoms referable to the disease. Joslin, Fitz, and Wilder are quoted as offering a good prognosis, a normal life expectancy and no tendency to progress to diabetes mellitus in these cases. (Blotner & Hyde, J.A.M.A., June 12, '43.)

\* \* \* \* \*

The Stomach in War: "There are certain figures of speech which while generally accepted as being only that, have yet a background of reality. It is frequently said that one 'has no stomach' for this or for that. The intent is to convey the idea that the individual has no taste, no inclination, for the action proposed or the situation to be faced. In that sense there are those who 'have no stomach for war.' Without doubt a situation which is causing much concern in the current war has been present perhaps to a lesser degree in all wars. There are being found a multitude of service men who quite literally have not stomachs to carry them through the stresses of war. At the meeting of our Association in Louisville in 1941 a medical officer of the Canadian army gave a talk that was startling in the reported incidence of peptic ulcer among the Canadian forces on European service. Unfortunately no manuscript covering his remarks was presented. The number of articles that have appeared in British medical journals on the subject of gastric ailments in the military services and the space that has been given to them, testify to the importance of the subject. Whether from actual incidence or from greater attention to diagnosis, there has been a distinct increase in reported cases of peptic ulcer among both the soldiery and citizenry of England. The increase has been more marked in duodenal than in gastric ulcers and has been relatively greater in men.

"The whole subject of peptic ulcer is being reviewed with, of course, a rechecking of the etiological factors. The hereditary predisposition is very generally accepted, evidenced by the high-strung nervous mechanism, the restless energy and the irritability of the person whose whole life is lived at high tension. These are the manifestations of a certain type of autonomic nervous system. Given this predisposition, the contributing factors most stressed by writers on the subject are faulty eating habits and tobacco. The quality of the food taken is given less weight than formerly, while hasty and intemperate eating, especially while under emotional strain of any kind is regarded as especially harmful. The influence of tobacco in the causation of ulcer has long been recognized, as has its deterrent effect upon ulcer healing.

"It is common knowledge that a considerable share of our people have a peptic ulcer at some time in their lives. Competent pathologists have put the figure as high as 17 per cent, based on autopsy findings. It will thus be seen that there is an immense backlog of quiescent and healed ulcers, that need but the conditions of military service or other added stress to light up anew.

"The life of the soldier and the sailor is full of occasions when he must bolt his food in the midst of excitement and collectively soldiers and sailors are mighty consumers of tobacco. It is easy to see how ulcer will develop in the susceptible and how the quiescent and healed ulcer will take on activity. The result is a severe loss to the fighting force, for the same factors that made the individual an ulcer subject made him also a fighting man. But just as the ulcer is a mandatory cause of recruit rejection, it is a positive cause for discharge from the service.

"The problems of gastric ulcer are more susceptible of solution than are those of some other gastric ills that plague the British service and quite

certainly our own. The British writers find no better name for these conditions than 'dyspepsia' or 'nervous dyspepsia,' which they employ apologetically as meaning only a complex of symptoms. The same contributing causes as of ulcer here are at work upon a different constituted individual with different results. The chronic dyspeptic of this type never was a fighting man and can never be made into one. He is the hypochondriac type with a tendency to shirk the responsibilities of life and with a distaste and inaptitude for physical exertion. His gastrointestinal symptoms run the scale of nausea, eructations, gastric pain and discomfort, heartburn, constipation, irregular appetite and vomiting. These are accompanied by complaints of spells of faintness, short and labored breathing, heart palpitations, flushes, tremors and arterial pulsations, the whole producing a picture of a subject that has taxed the patience and judgment of medical officers through the centuries.

"Judgment must be exercised in making a diagnosis though this is seldom difficult. A greater exercise of judgment is involved in determining the disposition to make of these cases. It is agreed that prolonged hospitalization will result in a situation where discharge from the service is the only solution. They should be kept in a hospital only long enough to exclude organic disease and then returned to duty. If any service of value is to be obtained from them it will be necessary to fit each into a duty for which he has some aptitude. It will require more than the usual allotment of supervisory patience if they are kept to their jobs and anything made of them.

"It should be understood that the suffering of these individuals may be as real and as intense as are those with organic disease. They must not be classed as malingerers. The condition that afflicts them has been called 'chronic incapacity,' a diagnosis that would look quite as well on a Certificate of Disability for Discharge as many another. In no sense have these individuals any stomach for war." (Editorial - The Military Surgeon, June '43.)

\* \* \* \* \*

Transfusion or Infusion Reactions Due to Pyrogens Can be Avoided: The reactions recorded by many writers are of a pyrogenic nature and not due to the transfusion of whole blood per se. Medical officers should bear in mind that autoclaving of equipment will kill live bacteria; however, the protein products of dead bacteria (pyrogens) may cause a severe reaction, i.e., severe chill and often as much as a 5°F. rise in temperature following the use of such equipment. Pyrogens are protein molecules of relatively low molecular weight (10,000 to 60,000), are heat stable and not removed from solutions by bacterial filtration or autoclaving.

Pyrogenic reactions can be avoided by using scrupulous aseptic technic in the collection of blood. All blood donor equipment and intravenous sets should be thoroughly cleaned and sterilized within four hours after use. This procedure may prove inconvenient at times but it is definitely worthwhile. If cleaning and sterilization cannot be carried out within four hours after use, all equipment should be thoroughly cleaned with a 2% sodium carbonate solution, flushed with tap water, followed by thorough rinsing in freshly distilled water and then immediately sterilized. (L.R.N.)

\* \* \* \* \*

The Use of Sea Water in the Control of Anopheles Albimanus: Hurlbut, in an article in press reports his observations on the use of sea water in the control of Anopheles Albimanus Wied. In Puerto Rico, Anopheles Albimanus breeds prolifically in certain coastal lagoons having varying concentrations of sea water. The degree of salinity is altered by tides, evaporation and rainfall. These factors operate to create favorable or unfavorable conditions for mosquito breeding according to the tolerance of the species.

The author concludes that (1) breeding of this species can be eliminated by increasing the relative salinity to about 75 per cent sea water; (2) this degree of salinity can best be maintained in marginal areas of lagoons by tidal action produced by an adequate sea connection.

\* \* \* \* \*

German Report on the Treatment of Infected Wounds: Russian infantry projectiles cause particularly nasty wounds which often call for amputation, for which the best method is "Zirkelschnitt" (guillotine). All wounds should be treated open - no stitching and no tight tampons. Only wounds of the brain, pneumothorax and articulations should be closed. Serum therapy of gas gangrene is not very efficient. Infected wounds should be treated with marfanilpron-talbin or prontosil. In minor operations evipan narcosis is recommended; major operations, ether. Early transport is recommended for fractures but not for lesions of the lung or abdomen. (Haverer, Mundhn. Med. Wechr. 1, 437, '42.)

\* \* \* \* \*

Prophylactic Use of Sulfaguanidine in Bacillary Dysentery: A rapidly progressing epidemic of bacillary dysentery among mentally handicapped children was stopped abruptly by the prophylactic use of sulfaguanidine in all well children and personnel in the building, after other segregation and treatment methods had failed. The dosage for each subject, whether adult or child, was 0.5 Gm. three times a day by mouth. (Scott, J.A.M.A., June 26, '43.)

\* \* \* \* \*

Sulfonamide Compounds in the Treatment of Ocular Infections: The author concludes that these drugs properly employed should lead to rapid and complete healing of the majority of ocular infections, caused by the viruses of trachoma, inclusion conjunctivitis and lymphogranuloma and by gonococcus, meningococcus, streptococcus, staphylococcus, pneumococcus, influenza bacillus, diplobacillus, coliform rods, Friedlander's bacillus and pyocyanus bacillus. Little or questionable effect is to be expected in brucellosis or tularemia and in infections due to non-hemolytic or anaerobic streptococci. No results are to be looked for in ocular infections such as ocular pemphigus, sympathetic ophthalmia, uveitis and ocular tuberculosis, syphilis and leprosy. Because of the occasional occurrence of mild or severe toxic reactions, oral therapy with sulfonamide compounds should not be used for minor infections and should be replaced by local therapy whenever possible. (Thygeson, Arch. Ophth., June, '43.)

\* \* \* \* \*

Germans Report on Anesthetic Used While Moving Wounded: Holle reports that the Germans are using as a means of temporary narcosis while transporting injuries from the front line a mixture which they call the SEE mixture (Scopolamin-Eucodol-Ephotonin). He says local anesthesia is relatively useless in a war with a moving front line and is applied only in cases in which there is danger of respiratory depression. He prefers ether to chloroform for inhalation anesthesia. (Deut. Militärarzt, 7, 85, '42.)

Lauber also recommends the SEE method by intramuscular injection and notes that it is also used as a basal anesthesia for ether narcosis, although it is not sufficient for full narcosis. Morphine and its derivatives are also recommended. (Med. Wschr., p. 3455, '42.)

\* \* \* \* \*

Roentgen Therapy of "Virus" Pneumonia: "Roentgen therapy with small doses, between 35 and 90 r, resulted in clinical cure within a few days in 45 out of 56 cases of virus pneumonia. The pulmonary consolidations disappeared within three to five days after roentgen treatment. The results of roentgen therapy were best at early states of virus pneumonia, but limited when irradiation was used later than two weeks after the onset of the disease.

"Roentgen therapy was the most effective mode of treatment for the control of the persistent cough which delayed complete recovery during convalescence in patients who had not received irradiation during the febrile stage.

"In early states, the r doses applied should be small. Treatment with doses exceeding 100 r during the early states resulted in alarming systemic reactions. No untoward reactions whatever were observed with the use of smaller doses." (Oppenheimer, Amer. J. Roentgen & Radium Therapy, May '43.)

\* \* \* \* \*

It has been known for some time that x-ray has a markedly beneficial effect on pneumonic processes, as in other inflammatory conditions. However, use of x-ray has been overshadowed by sera and sulfa drugs and little attention paid to it. With regard to virus pneumonia the picture is different inasmuch as sera and sulfa drugs are of little avail. Thus x-ray should always be borne in mind as a valuable therapeutic agent. Light cases clear spontaneously and rapidly, but in severe cases the use of x-ray may effect vast improvement. The value of x-ray in virus pneumonia is not generally appreciated; the above article is therefore important and timely. Technic outlined appears reasonable. (C.F.B.)

\* \* \* \* \*

Succinylsulfathiazole in the Treatment of Bacillary Dysentery: Two hundred and twenty-five soldiers ill with dysentery due to *Shigella paradyenteriae* were treated with succinylsulfathiazole. No amelioration of the illness was produced nor was its duration shortened. The carrier rate in the bacteriologically proved cases, treated with succinylsulfathiazole, was, however, 2.6 per cent and in a comparable untreated group 18.2 per cent. (Roberts & Daniels, J.A.M.A., July 3, '43.)

\* \* \* \* \*

New Gases - The Nitrogen Mustards: A series of new war gases, known as "nitrogen mustards," are likely to be encountered in the event of gas warfare. The term "nitrogen mustards" signifies a group of related organic amine derivatives, whereas the older chemical agent designated as "mustard" is an organic sulfide derivative.

1. Properties: The nitrogen mustards are vesicant, casualty producing and persistent agents, although the most volatile persists less than two hours even under conditions of heavy contamination. The compounds best adapted to gas warfare are liquids, colorless to pale yellow, and have faint odors varying from slightly fishy to practically odorless. They are, therefore, not easily detected in the field by odor.

2. Toxicology: (a) General: The nitrogen mustards act as vesicants or necrotizing irritants to all exposed tissues, including the skin, eyes and respiratory tract. Systemically, these agents destroy the leukocytes of the blood and act as necrotizing agents to lymphoid tissue and the hemopoietic system. Mild exposure, however, will probably not cause noticeable systemic symptoms.

(b) Eyes: In addition to the irritant and necrotizing action on the eye, a strong miosis is initially produced. The compounds vary in their power to damage the eye, but the more volatile members produce injury equal to or greater than that produced by a similar mustard vapor exposure. The liquid forms of the more volatile members damage the eyes more severely than liquid mustard.

(c) Skin: The vapors are only about one-fifth as damaging to the skin as equal concentrations of mustard vapor. The liquids blister the skin more rapidly but rather less severely than equal amounts of mustard.

(d) Respiratory Tract: The less volatile members damage the respiratory tract to about the same degree as an equal concentration of mustard vapor, but because of their low volatility, they may be less dangerous in the field than mustard. The more volatile members are only one-third to one-half as damaging to the respiratory tract as mustard vapor of equal concentration, but because of their great volatility a heavy field contamination may be as dangerous to the respiratory tract as a similar mustard contamination.

(e) Lethal Dose: The systemic absorption of two to three mg. per kilogram of body weight is fatal to a majority of animals.

3. Symptoms: (a) Eyes: (1) Mild Exposure: The eyes apparently are more susceptible to the vapors of the more volatile nitrogen mustards than any other exposed tissue. A mild exposure produces in man a mild lacrimation and smarting of the eyes, beginning in five to eighteen minutes after exposure, but there are no early objective signs. These early symptoms disappear after a few minutes and may be overlooked but reappear at intervals, with increasing frequency and severity, until they finally become persistent about two and one-half hours after exposure. Contraction of the pupil is now present. A slight conjunctival reaction is apparent at this time, but the cornea is clear. Subjective and objective symptoms continue to increase to eight to ten hours after exposure, at which time there is a steamy haziness of the cornea, a

marked erythema and some edema of the palpebral and bulbar conjunctiva. Photophobia is generally present.

(2) Severe Exposure: The symptoms are at first similar to, but more pronounced than those of a mild exposure, the miosis being marked and the cornea edematous and cloudy. Irritation, lacrimation, and deep eye pain are prominent. Untreated, the miosis and deep eye pain may persist for several days. Later, parts of, or even the entire corneal epithelium may exfoliate.

(b) Skin: The skin is more resistant to the vapors of these agents than other exposed tissues, and is less affected than by equal concentrations of mustard vapor. There may be irritation and itching as with mustard. Later, blisters may appear in the erythematous areas. The agents in liquid form are quite vesicant and produce lesions similar to, but generally more shallow than mustard lesions and the blisters appear more quickly.

(c) Respiratory Tract: It is believed that the symptoms in man would be much the same as those caused by mustard. All data on the effects on the pulmonary tract have been obtained with laboratory animals.

(d) General Effects: Headache and deep eye pain may be marked during the stage of miosis. The victim is likely to be depressed and apprehensive about his vision and require reassurance. There may be a marked tendency to hemorrhage and greatly lowered resistance to secondary infection.

4. Protection: (a) Protective Equipment: The service gas mask, protective clothing against ordinary mustard (permeable and impermeable) and eye shields are equally as effective with nitrogen mustards as with ordinary mustard.

(b) Protective Ointment: S-461 protective ointment is a new preparation recently added to the Naval Medical Supply Table. It was developed as a mechanical protective against all war gases inclusive of nitrogen mustards and as a specific decontaminant or neutralizer against mustard gas both in the liquid and vapor form. This ointment is to be used as a protective when a gas attack is almost certainly known to be impending, or when the enemy starts to project gas indiscriminately in a certain area. When used as a protective it is applied only to the exposed parts of the body.

5. Treatment: (a) Eyes: Measures, both first aid and definitive, for the treatment of eye injuries with ordinary mustard are equally applicable to eye injuries from nitrogen mustard. There is no additional or specific therapy. In general, the symptoms and inflammatory lesions, iritis, etc., are more severe and intensive, and early cycloplegic treatment should be effected.

(b) Skin: In case of doubt as to which type of mustard is being dealt with, the skin should be treated first with S-461 anti-mustard ointment, provided erythema has not developed, and then washed thoroughly with large amounts of soap and water. However, if the gas has been definitely identified as nitrogen mustard, S-461 ointment is not used. Blot off any visible liquid and then apply soap and water. Late treatment of the vesicles does not differ from that outlined for ordinary mustard. (See Bureau of Medicine and Surgery Form Letter "Prevention and Decontamination of Mustard Gas and Lewisite Casualties" reprinted in the Bumed News Letter of July 9, '43.) (E.W.B.)

Industrial Incentive Work - Assignment of Convalescent Personnel: The Chief of the Incentive Division has devised a plan to utilize part of the convalescent leave period of officers and men to stimulate individual effort and to raise the morale of the noncombatant fighter on the industrial front.

In a recent communication to the Chief of the Bureau of Medicine and Surgery, the Incentive Division requested the services of approximately 30 men, two to each of the 14 District Incentive Officers. It was suggested that such personnel be given leave with the understanding that they work with the Incentive Officer during the period of such leave, the Incentive Division then handling all necessary expenses. The physical welfare of these men would be constantly considered and undue exploitation avoided.

The Surgeon General, in a letter to the commanding officers of all Naval Hospitals in the Continental United States, authorized full cooperation with the District Industrial Incentive Officer pursuant to the plan proposed. It was pointed out that the utilization of personnel for this purpose should be only with the full consent of the individual concerned and after careful consideration of the possible effect of the plan on him in relation to his return to normal duties or pursuits. The granting of leave for this purpose is to be subject to existing instructions or to such specific instructions as may be issued by the Bureau of Naval Personnel.

War plant visits by officers and men who have had combat experiences have been found most effective in stimulating production. Men bearing visible evidence of battle wounds provide a most direct and forceful call upon the workers for loyal and enthusiastic support.

\* \* \* \* \*

First-Aid Use of Oil Removing Detergents: Special chemical detergents are available; however, their use in first aid is a question of policy. Some points which are to be considered with their use are that cleansing operations, which carry contamination into a wound without its prompt removal, are theoretically worse than no cleansing. Statistics show that imperfect cleansing, i.e., not followed by radical surgery, actually does increase incidence of clinical infection. Need for detergents in removing fuel oil is at least debatable, for oil cannot be removed by mechanical and/or chemical means without further traumatizing tissues and increasing shock. Fuel oil has no properties which require its removal from intact skin, wound, or burn. Fuel oil is bacteriostatic. It does not adhere to wet surfaces in the wound, is gradually washed away by exudate and taken up by dressings, and tackiness of tarry constituents is destroyed by the petrolatum recommended in the Bureau of Medicine and Surgery Form Letter of January 21, 1943, on burns, or the mineral oil recommended by Schwartz, National Institute of Health, for removal of oil. Oil, in the neighborhood of the wound, fixes bacteria where they are and inhibits their multiplication.

\* \* \* \* \*

Naval Hospital Fund Abolished: Congressional Act of June 15, 1943, abolishes Trust Funds. On and after July 1, 1943, Hospital Fund deductions will not be made in accounts of Navy and Marine Corps personnel.

Chloroform Contraindicated When Processing Acrylic Resin Dentures: It has been the common practice among prosthetic dental technicians to use chloroform in dissolving the residue of base plate wax remaining in a flask, after the case has been boiled out.

Chloroform causes the denture to warp in the tuberosity and hanular notch area of the maxillary denture; also, in the processed denture, it causes the tissue side of the palate to have a pitted finish.

Chloroform penetrates the stone model even though it is tinfoiled and thoroughly washed out with hot water.

When the flask is packed with acrylic material and brought to the proper temperature for curing, heat causes chloroform to volatilize from the case and to cure the acrylic material with a rough surface.

Wax should be removed by prolonged flushing with hot water, and the use of chloroform discontinued. (R.D.P.)

\* \* \* \* \*

The Use of Deproteinized Pancreatic Extract in the Treatment of Ureteral spasm: Walther and Willoughby give their experience in the use of this substance in a series of 70 cases.

In place of the usual sedation, deproteinized pancreatic extract was given just before the introduction of the cystoscope. Following instrumentation, if symptoms presented themselves, additional injections, usually in 3 cc. doses, were used as often as every 3 hours. Further injections, usually in 2 cc. doses were given every 48 hours as indicated.

The authors report excellent results in the prevention of ureteral spasm during and following instrumentation. No definite conclusions could be made in respect to accelerating the passage of ureteral calculi. No deleterious side effects were reported. (New Orleans M. & S. J., Oct. '42.)

\* \* \* \* \*

The physiological action of deproteinized pancreatic extract seems to be that of inhibition of the sympathetic nervous supply of the ureters. Foreign bodies, strictures and perhaps even psychic factors may cause intense and painful spasm of the ureter. Deproteinized pancreatic extract tends to relieve this spasm.

It appears that for ureteral spasm and post-cystoscopic reaction deproteinized pancreatic extract is of value. In severe ureteral colic, however, it seldom gives the patient much relief. It is usually necessary to follow up with the old reliable morphine sulphate and atropine. (H.J.C.)

\* \* \* \* \*

Treatment of Scabies by Means of Benzyl Benzoate: Dr. J. Gardner Hopkins, Consultant in Dermatology to the Committee on Medicine of the National Research Council has made the following recommendation approved by the Committee. "That benzyl benzoate be recommended to supersede sulphur as routine treatment of scabies; that it be used in 25 per cent aqueous emulsion of the general type - benzyl benzoate, 25.0; stearic acid, 2.0; triethanolamine, 0.5; water to make, 100.0. As an alternative preparation a solution of benzyl benzoate, 25.0; green soap, 35.0; alcohol - 95%, 40.0.

"Directions: Bathe men with soap and water and dry. Benzyl benzoate preparation painted by attendant over entire body, neck to soles, using a paint brush and employing about 2 ounces for treatment. Repeat application second day. Remove emulsion by bathing third day.

"When a case of scabies is reported, the unit medical officers should inspect all men in the same barracks."

\* \* \* \* \*

Schistosomiasis. Occurrence in Southern Tunisia: Information from the London School of Tropical Medicine indicates that Southern Tunisia is one of the worst areas in the world for this disease. The highest incidence occurs in July. A few points on the transmission and prevention of schistosomiasis may be repeated: Both S. haematobium and S. mansoni occur in Africa. The transmission and prevention are essentially the same for both species.

Transmission: The eggs escape mainly in the urine in the case of S. haematobium; in the feces, in the case of S. mansoni. The intermediate host is a snail (a number of different genera can transmit) which may be found in slow moving streams, irrigation ditches, limestone sinks, reservoirs, and small pools after flooding of streams. The larvae (cercariae) which emerge from the infected snails infect man by penetration of the skin; thus the disease may be contracted while bathing, wading, working, or washing clothes in infected water, and possibly through the use of a polluted public water supply. A skin eruption sometimes called "water rash" may indicate the penetration of the cercariae.

Prevention: (1) Prohibit entering or using unpurified fresh water in endemic areas; (the apparent absence of snails from such water does not guarantee that the water does not contain cercariae) (2) in case of accidental or necessary entrance into water suspected of containing cercariae, immediate and complete bathing with soap and pure water may prevent infection; (3) copper sulfate in the water in a dilution of 1:200,000 will kill cercariae and snails. (E.G.H.)

\* \* \* \* \*

Thiamin Helpful in Protection Against Hemorrhagic Shock: A Vanderbilt University investigator (Lamson) reports that in studying the cellular oxidative enzyme systems in shock he has demonstrated a breakdown of diphosphothiamine. The administration of thiamin, it was found, increases the amount of blood which can be withdrawn from an animal without inducing hemorrhagic shock. (OEMcnr - 584.)

\* \* \* \* \*

Dark-Field Microscopic Technic - Advantages of High Dry Objective and Other Hints: For ordinary dark-field diagnostic procedures, as for the demonstration of Treponemata in syphilitic lesions, the high dry objective may be used to better advantage than the oil immersion. In using this objective, oil is placed between the dark-field condenser and the slide but not between the objective and the cover-slip.

The high dry objective gives a larger field and a greater depth of focus, permitting the examination of more material and an appreciable saving of time. The tendency of spirochetes to dive out of focus is diminished especially if a thin preparation is made. Difficulties due to adhesion of the cover-slip to the lens of the oil immersion objective are removed and to a considerable degree, the mistaking of artefacts for spirochetes. No funnel stop is necessary in the high dry objective. When used in combination with a suitably adjusted strong light and a 10 x or 12.5 x ocular, the high dry soon becomes the objective of choice. If it is desired to study the spirochete under the oil immersion objective of suitable aperture containing a funnel stop, oil must be used. Further high dry objective examination is then impossible.

The most common reason for failure with the dark-field technic is unsatisfactory lighting. A powerful source of light is essential. Direct sunlight, the arc-light, or a lamp capable of giving a point source of light of high brilliancy should be used. In emergencies, a strong focusing flashlight (three cells or more) may serve. Since the special dark-field condensers are designed for parallel beams of light, a parallelizing system should be employed with artificial light and the light then reflected into the condenser with the plane mirror of the microscope. Beams of direct sunlight are parallel. If sunlight is too brilliant, ground glass may be used before the mirror. Protect the preparation from the direct rays of the sun. If a lamp is used without a ground daylight glass or a parallelizing lens, the concave mirror should be used. Good results are usually obtained if one: (1) Uses clean slides and cover-slips of correct thickness (frequently indicated on the condenser); (2) carefully centers the special dark-field condenser; (The top of the condenser should be thoroughly cleaned in order to facilitate the finding of the centering circle.) (3) brings into close proximity the top of the condenser and the bottom of the slide; (It should be possible to bring the top of the condenser level with the top of the stage.) (4) removes air bubbles from the oil between the condenser and the slide; (5) makes a thin rather than a thick preparation; (Press the cover-slip with clean filter paper, gauze, a roll of toilet tissue, etc.) (6) avoids the presence of excessive amounts of large elements such as blood cells.

The dark-field illumination may be considered adequate when the serum colloids are seen as jiggling pin-points of bright light. (E.P.C.)

\* \* \* \* \*

Penicillin Therapy in Sulfonamide-Resistant Gonorrhea: Dr. J. E. Moore, Chairman, Committee on Venereal Diseases, National Research Council, reports that penicillin has been used in 100 cases of sulfonamide-resistant gonorrhea with 99 cures and one failure. Recommended standard therapy in these cases is 10,000 units intramuscularly every three hours for forty-eight hours. However, cure was effected in most of the 99 cases by fifteen hours or less of penicillin therapy.

\* \* \* \* \*

The Naval Medical Research Institute is currently conducting a number of investigations which give promise of much practical value to the Naval service. Among these is the development of ointments for protection against flash burns. Experiments have shown that a degree of protection greater than afforded by a regulation Navy undershirt can be obtained by certain preparations suitable for skin application.

The Institute has also undertaken a study to increase the duration of effectiveness of insect repellents as an adjunct to the problem of malaria control. Several materials have been developed which afford protection in laboratory experiments with caged Aedes aegypti for 60 to 72 hours. Field trial will be conducted in the near future.

A one-step method of sterilization of canteen water with an iodine preparation, discussed below, holds considerable promise.

The psychrometric compartments of the Institute are now in commission and some interesting studies have been made on clothing in relation to environmental conditions of heat and humidity. These investigations should have much practical value in designing equipment for jungle warfare - heat with high relative humidity - or for desert warfare with high temperatures but low moisture content of the ambient air. (W.L.M.)

\* \* \* \* \*

Tincture of Iodine Efficient in the Sterilization of Drinking Water: A summary of work recently completed on the sterilization of drinking water by iodine compounds in the Naval Medical Research Institute, indicates that commonly available tincture of iodine is a safe and reliable method of sterilizing drinking water. Water may be considered potable in 15 minutes following the introduction of two or three drops of full strength 7 per cent tincture of iodine in a canteen of water. Of other iodine compounds investigated, diglycine hydriiodide proved most efficient. An effort is now being made to incorporate the compound in a tablet suitable for a one-step field method of canteen sterilization.

\* \* \* \* \*

Penicillin: The use of penicillin has recently been authorized for the Naval Hospitals at St. Albans, N.Y., Philadelphia, Pa., Bethesda, Md., Portsmouth, Va., Great Lakes, Ill., Seattle, Wash., Oakland, Calif., Mare Island, Calif., San Diego, Calif., and Pearl Harbor, T.H. It is expected that the distribution will be extended as soon as production and other conditions permit.

The letter of information quoted below, which goes somewhat into detail on the clinical aspects of the use of penicillin, was written as a guide for the introductory phase of penicillin therapy.

\* \* \* \* \*

## BUREAU OF MEDICINE AND SURGERY

L8-2/JJ57(042)

5 July 1943

LETTER OF INFORMATION AND INSTRUCTIONS ON THE USE OF PENICILLIN.

1. Penicillin will be available for the treatment of Navy personnel beginning in the early part of this month. It will be carried in the Supply Catalog as S1-1130, Penicillin, crystalline, 100,000 Oxford units in ampoule, (5 amp. in box). The quantity available is limited, and the issue, for the moment, is restricted to certain hospitals. As rapidly as production increases, distribution will be liberalized. A brief discussion of this new drug, indications for its use, methods of administration, and directions for the necessary records and reports are given in this letter.

2. The source and nature of penicillin: Penicillin is an antibiotic agent which is produced by the mould, Penicillium notatum, when cultivated on suitable media and under certain conditions. It is extracted from the medium, purified, dried, tested for pyrogens and sterility, and packaged in sterile ampoules under aseptic conditions. At present it is supplied as the sodium salt, which is a fine powder varying in color from light yellow to dark brown. Other salts of penicillin may be available later.

3. Storage and stability: The dried powder, when contained in ampoules, is quite stable at ordinary room temperature, but high temperatures and prolonged exposure at room temperature cause significant deterioration. To assure maximum potency, the ampoules should therefore be stored in refrigerators. In liquid form penicillin is extremely unstable. Solutions should therefore be made up preferably just before administration, or at least daily and then kept under refrigeration at about + 4°C.

4. Preparation of penicillin for treatment: Penicillin is extremely soluble and may be dissolved in sterile, distilled pyrogen-free water, or in sterile normal saline or 5 per cent glucose solution. Sterilization of the penicillin solution is not necessary, and must, in fact, not be done since heating destroys the potency. In occasional batches, small particles of insoluble material may be present. These can be removed by passing the solution through sterile filter paper. The desirable strength of the solution varies with the method of administration.

## (a) For intravenous injection:

(1) For direct injection through a syringe, dissolve the dry powder in sterile normal saline solution in concentrations of 1,000 to 5,000 units per cc.

(2) For constant intravenous therapy, use a low concentration of 25 to 50 units per cc. in sterile normal saline solution or 5 per cent glucose solution.

(b) For intramuscular injection:

To keep the total volume of individual injections small, use a concentration of 5,000 units per cc. of normal saline solution.

5. General indications for the use of penicillin: Under the auspices of the National Research Council, penicillin has now been used on more than 500 cases. It has been found to be extremely useful in the treatment of infections due to the staphylococcus, hemolytic streptococcus, the Diplococcus pneumoniae, Neisseria gonorrhoeae, and Neisseria intracellularis, and particularly valuable when sulfonamides have failed in these infections.

Experimentally it has been found a potent agent in gas-bacillus infections, but up to the present time there are no studies on human cases of gas gangrene.

Penicillin has not been found effective in the treatment of subacute bacterial endocarditis.

6. Selection of cases: In order to effect the maximum utilization of the limited quantities available, a judicious selection of cases should be exercised. In general, sulfonamide-resistant infections should receive first consideration. The following priority list is suggested:

- (a) Staphylococcus and hemolytic streptococcus bacteremia.
- (b) Meningitis due to staphylococcus and hemolytic streptococcus.
- (c) Septic compound fractures and wounds, and osteomyelitis when due to susceptible micro-organisms.
- (d) Sulfonamide-resistant gonorrhea (failure to respond to two courses of sulfonamides, each course consisting of, at least, 20 Gms. of the drug).
- (e) When sulfonamides have failed, penicillin may also be used for such grave conditions as extensive cellulitis of face, mouth and neck, multiple abscesses, suppurative arthritis and empyema, if these infections are due to susceptible micro-organisms.

7. Methods of administration and dosage: Inasmuch as penicillin is excreted rapidly in the urine, it is necessary to give large amounts at frequent intervals in order to obtain an optimal effect. It is possible that diuresis may undesirably increase urinary loss. Excessive introduction of fluid, orally or parenterally, should therefore be avoided. The amount of penicillin necessary will vary considerably with the severity of the infection and probably other factors. The examples given below are intended as guides for average cases.

## (a) Serious infections with bacteriemia.

(1) Constant intravenous injection of a solution at a rate designed to deliver 5,000 to 10,000 units per hour; or

(2) An initial dose of 20,000 units followed by 5,000 units every hour injected directly or into the tubing of an inlying intravenous set. Some cases have required much higher dosage. In one case, 600,000 units daily were necessary to control the infection.

(3) After the temperature has returned to normal, the total dose in a twenty-four hour period may be reduced by one-half, but should be continued for at least seven days. The usual total amount required for cases of staphylococcus bacteriemia is from 500,000 to 2,000,000 units but as much as 5,000,000 in two weeks have been found necessary.

## (b) Septic compound fractures and wounds, and osteomyelitis.

A dosage schedule of 10,000 units every two hours, or 15,000 units every three hours intravenously for the first two weeks has been used. Total dosage in these cases has varied from 1,000,000 units in nine days to 4,250,000 units in thirty-four days. The average case will require from 1,000,000 to 1,500,000 units in ten to fifteen days.

## (c) Sulfonamide-resistant gonorrhea.

Give 10,000 units intramuscularly in the buttocks or intravenously (the former may be more convenient) every three hours, day and night for forty-eight hours, a total of 160,000 units in sixteen injections. Larger dosage is not indicated. It appears not unlikely, however, that a more concentrated administration, for example, 20,000 units every three hours for only five doses, may be equally effective. The minimum dosage has not yet been determined. Some cases have been cured in nine hours.

## (d) Meningitis.

Penicillin does not reach the subarachnoid space in appreciable amounts when given intravenously or intramuscularly. It has therefore been given through lumbar or cisternal puncture. The dosage has been 10,000 units in 10 cc. of physiological saline solution once or twice daily, depending on the clinical course and bacteriological findings.

## (e) Empyema.

Penicillin in normal physiological saline solution should be injected directly into the empyema cavity after aspiration of pus or fluid. This should be done once or twice daily, using 30,000 or 40,000 units, depending upon the size of the cavity, and the type of infection and number of organisms. Penicillin solutions should not be used for irrigation, since it requires at least 6 to 8 hours for the maximum effect of a given dose.

8. Untoward effects: One of the striking features of penicillin treatment has been the very low incidence of side reactions or signs of toxicity. It should be noted in this connection that the sodium salt of penicillin as now supplied probably contains no more than 10 per cent pure penicillin so that some of the reactions which have been observed may have been due to impurities. Chills and mild to moderate febrile reactions occur occasionally, and are probably due to pyrogens. Flushing of the face and intramuscular soreness have been recorded a few times. Urticaria appeared eleven times in a series of 264 cases. One observer has recorded profound fluctuations in plasma proteins, blood electrolytes, and water balance in cases with septic compound fractures treated with penicillin. Thrombosis in veins used for injection is rare, and then probably due to faulty technic.

9. Records and reports: In order to gain the much needed additional information on the efficacy, probable shortcomings, and possible dangers of this drug, it is highly desirable that adequate case records be kept and that the data of these records be made available to all medical officers. This can best be done by summaries or brief articles submitted to the Bureau of Medicine and Surgery for publication in special letters, Bumed News Letter or the Naval Medical Bulletin, according to the nature and extent of the articles. The record of each case should therefore obviously include, at least, the following data:

- (a) A brief pertinent history of the illness.
- (b) The diagnosis with supporting clinical and laboratory data.
- (c) Dosage and methods of administration of the penicillin.
- (d) Therapeutic result with the necessary laboratory evidence of success or failure.
- (e) Untoward effects and difficulties in administration, if any.

In addition to the special articles referred to above, there shall be submitted to this Bureau a routine monthly report which shall contain the information outlined in the form below, and in addition any other data that may be helpful in the procurement and distribution of this drug.

REPORT ON THE USE OF PENICILLIN FOR THE MONTH OF . . . . .

TOTAL UNITS:

Received . . . . .  
Expended . . . . .  
Desired per month . . . . .

SUMMARY OF CASES TREATED

Diagnosis	No. Cases	Av. Total Dose	Results	
			"Success"	"Failure"
		- 23 -		

10. Organization for the use of penicillin: In order to make the best use of this drug, it is directed that a "Penicillin Service" or "Penicillin Team" be established in each hospital receiving allotments of the drug. The medical officer to be in charge of this service and his assistants should be selected with careful consideration of their fitness for such an undertaking. The medical officer in charge should be given full responsibility for the use of penicillin in all units of the hospital. It shall be his duty to acquaint himself and his associates with all available data on the use of penicillin and to keep informed of current developments; to select cases after due consultation; to supervise administration; to observe and record results and to render the reports indicated in this letter.

11. Patient's permission: Since the clinical use of penicillin must still be considered in an experimental stage, it should be given only after due discussion with the patient and after obtaining his signed request for treatment by penicillin.

ROSS T. MCINTIRE.

\* \* \* \* \*

OFFICE OF THE SECRETARY

Opl3C-jc,  
Serial 108213,  
7 June 1943.

From: The Secretary of the Navy.  
To: All Ships and Stations.  
Subject: U.S. Naval Hospital, New Orleans, Louisiana - Establishment of

1. The buildings, utilities, accessories, and appurtenances, now assigned, under construction, and projected for the subject hospital are hereby established, as of 1 June 1943, and designated:

U.S. Naval Hospital,  
New Orleans,  
Louisiana,

as an activity of the Eighth Naval District.

2. Bureaus and offices take necessary action.

JAMES FORRESTAL  
Acting Secretary of the Navy

C-LET

BUREAU OF MEDICINE AND SURGERY  
NAVY DEPARTMENT

P3-2/P7(032)

May 22, 1943.

From: The Chief of the Bureau of Medicine and Surgery.  
To: Commanding Officers, Naval Hospitals (as listed).

Subject: Hospital maternity and infant care for wives and infants of enlisted men.

Reference: ALNAV #91, May 5, 1943.

1. Reference has informed the Naval service of the program established by the Children's Bureau of the Department of Labor under which medical, nursing and hospital maternity and infant care for the wives and infants of enlisted men in the fourth, fifth, sixth or seventh pay grades are provided, without cost to the personnel concerned, under an appropriation made by Congress, subject to adoption of the plan by the several individual States and the cooperation of the respective state health departments.

2. At the request of the Children's Bureau of the Department of Labor and in order that the program may be of all possible benefit to dependents of enlisted personnel of the Navy and Marine Corps, this Bureau has agreed to accept authorizations from state health departments for hospital maternity care in lieu of the prepayment of hospitalization charge or guarantee of such payment now required by Circular Letter F - "Supernumerary Patients" of Appendix D, Manual of the Medical Department.

3. All state health agencies with plans approved by the Children's Bureau may authorize hospital care under the program. In a few states the state health agency has deputized official local health agencies to authorize care under this program.

4. The authorization for hospital care in every state will specify the maximum period of hospital care authorized without necessity of renewal. The initial authorization in practically all states is for a hospitalization period of two weeks.

5. The hospital rendering services will bill the State Health Agency authorizing the intramural care at the reciprocal rate for official patients prescribed by the Federal Board of Hospitalization. Charges for this hospital service should be distributed during the remainder of the fiscal year 1943, as follows:

Naval Hospital Fund	at \$0.80 per diem
Medical Department, Navy	at 2.95 per diem

Commencing with 1 July 1943 all charges for this hospital service should be credited to the appropriation, Medical Department, Navy. The Hospital will submit a quarterly report of collections to the Bureau, depicting credits to the appropriations affected.

ROSS T. McINTIRE

\* \* \* \* \*

BUREAU OF MEDICINE AND SURGERY

P3-2/821(053)  
YS-avr

20 May 1943

From: The Chief of the Bureau of Medicine and Surgery.  
To: All Ships and Stations.  
Subject: Aviation Personnel Admitted to the Sick List--Designation  
of on Form F Card.  
References: (a) BuM&S ltr. A2-2/EN10(113-38), dated October 1942.  
(b) Par. 2417, Manual of the Medical Department, U.S.  
Navy, 1938.

1. Effective as of date received, aviation personnel admitted to  
the sick list shall be designated on the Form F card in the space on line 3,  
Aviation, according to the following definitive abbreviations:

N. A. F. - - - - - Commissioned aviator with flight orders.  
N. A. G. - - - - - Commissioned aviator without flight orders.  
N. A. P. F. - - - - - Enlisted "pilot" with flight orders.  
N. A. P. G. - - - - - Enlisted "pilot" without flight orders.  
A. F. - - - - - Enlisted aviation personnel, "not pilot"  
but with flight orders.  
A. G. - - - - - Enlisted aviation personnel, no flight  
orders.

2. In accordance with paragraph 1 of this letter, instructions  
of paragraph 2417, Manual of the Medical Department, U.S. Navy, stand modified  
wherein the previous designation flight (FL) was used.

ROSS T. McINTIRE

## BUREAU OF MEDICINE AND SURGERY

P3-2NH (054)

C-LET

May 17, 1943

From: The Chief of the Bureau of Medicine and Surgery.  
To: All Ships and Stations.  
Subject: Suspension of Reimbursement Covering Hospitalization of Army and Navy Personnel Overseas.  
Reference: (a) ALNAV 97, May 12, 1943.

1. By agreement between the War Department and the Navy Department no charges will be made as between the two services for the furnishing of supplies and services in connection with the hospitalization of United States Army and Navy personnel in the overseas medical department facilities of either service.

2. This suspension period, during which requests for reimbursement of medical and hospital costs are waived, is retroactive to include all outstanding statements for reimbursement, and the arrangement will be continued in force for the duration of the war and for six months thereafter.

3. Accordingly, no financial reports will be submitted from naval hospitals or other naval Medical Department activities outside of the continental United States (the forty-eight States of the Union) covering the hospitalization or medical care of United States Army personnel; and Form U or other financial reports will not be required covering the hospitalization or medical treatment of United States Navy personnel by the Medical Department of the United States Army outside of the continental United States.

4. Inasmuch as the maintenance of complete medical records is of vital importance in the protection of the interests of the Government and of the individual, it is essential that record of medical care and hospitalization by the Army be obtained and entered in the individual health record of the officer or enlisted man of the Navy or Marine Corps concerned, and that all required Medical Department statistical reports be rendered. Similarly, when Army personnel are cared for by the Medical Department of the Navy, proper records of hospital and medical care will be made and transmitted to the cognizant Army authorities.

ROSS T. MCINTIRE.

